

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

Jacques Breitenstein ET. AL.

PHFR00143

Filed: CONCURRENTLY

Title: METHODS OF PROCESSING IMAGES

Commissioner for Patents  
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to calculation of the filing fee and examination,  
please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

3. A method of processing images as claimed in claim 1, characterized in that said step of filtering said images uses two neighborhoods (N1) and (N2) of a given pixel, the gap (GAP) between these neighborhoods being user-adjustable.

5. A method of processing images as claimed in claim 1, characterized in that said sub-step of analyzing the connectivity of neighboring pixels based on their directions uses a neighborhood of a given pixel, this neighborhood extending in the direction of the pixel considered, this direction being determined during said sub-step of estimating the direction of each pixel of the image.

7. A method of processing images as claimed in claim 1, characterized in that said sub-step of selecting groups of

pixels uses a user-adjustable parameter M, this parameter M allowing computation of the minimal sum of contrasts of the pixels of a given group required for this group to be selected.

8. A method of processing images as claimed in claim 1, intended to detect artery anomalies, characterized in that it further comprises the steps of:

skeletonizing for extracting a skeleton of curvilinear structures,

measuring artery diameters,

taking decisions on the basis of the diameters and rules predefined by an operator.

9. A method of processing images, intended to detect artery anomalies in three dimensions, having at least a first digitized image and a second digitized image of the same artery as inputs, characterized in that it comprises, in series, a method of:

processing images as claimed in claim 1, applied to the first and the second digitized image, for giving a first and a second processed image, and the steps of:

skeletonizing, applied to the first and the second processed image, for extracting a skeleton of curvilinear structures of the first processed image and a skeleton of curvilinear structures of the second processed image,

reconstructing a 3D image of the artery, based on the first and the second processed image and their skeletons, for giving a 3D image of the artery,

measuring artery diameters, based on the 3D image of the artery,

taking decisions on the basis of the diameters and rules predefined by an operator.

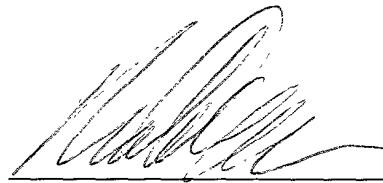
10. A computer program which can be carried out by means of a processor, intended to perform a method of processing images as claimed in claim 1.

REMARKS

The foregoing amendment to the claims was made solely to avoid filing the claim in the multiple dependent form so as to avoid the additional filing fee.

The claims were not amended in order to address issues of patentability and Applicant respectfully reserves all rights she may have under the Doctrine of Equivalents. Applicant furthermore reserves her right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or continuing applications.

Respectfully submitted,



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APPENDIX

3. A method of processing images as claimed in claim 1  
~~er-2~~, characterized in that said step of filtering said  
images uses two neighborhoods (N1) and (N2) of a given pixel,  
the gap (GAP) between these neighborhoods being user-  
adjustable.

5. A method of processing images as claimed in ~~any one~~  
~~of claims 1 to 4~~ claim 1, characterized in that said sub-step  
of analyzing the connectivity of neighboring pixels based on  
their directions uses a neighborhood of a given pixel, this  
neighborhood extending in the direction of the pixel  
considered, this direction being determined during said sub-  
step of estimating the direction of each pixel of the image.

7. A method of processing images as claimed in ~~any one~~  
~~of claims 1 to 6~~ claim 1, characterized in that said sub-  
step of selecting groups of pixels uses a user-adjustable  
parameter M, this parameter M allowing computation of the  
minimal sum of contrasts of the pixels of a given group  
required for this group to be selected.

8. A method of processing images as claimed in ~~any one~~  
~~of claims 1 to 7~~ claim 1, intended to detect artery  
anomalies, characterized in that it further comprises the  
steps of:

skeletonizing for extracting a skeleton of  
curvilinear structures,  
measuring artery diameters,  
taking decisions on the basis of the diameters and  
rules predefined by an operator.

9. A method of processing images, intended to detect artery anomalies in three dimensions, having at least a first digitized image and a second digitized image of the same artery as inputs, characterized in that it comprises, in series, a method of:

processing images as claimed in ~~any one of claims 1 to 7~~ claim 1, applied to the first and the second digitized image, for giving a first and a second processed image, and the steps of:

skeletonizing, applied to the first and the second processed image, for extracting a skeleton of curvilinear structures of the first processed image and a skeleton of curvilinear structures of the second processed image,

reconstructing a 3D image of the artery, based on the first and the second processed image and their skeletons, for giving a 3D image of the artery,

measuring artery diameters, based on the 3D image of the artery,

taking decisions on the basis of the diameters and rules predefined by an operator.

10. A computer program which can be carried out by means of a processor, intended to perform a method of processing images as claimed in ~~any one of claims 1 to 9~~ claim 1.